

HIA - Ethiopia

03-31-2023

WHO Global AQG, PM_{2.5} 2021

Table 0.1. Recommended AQG levels and interim targets

Pollutant	Averaging time	Interim target				AQG level
		1	2	3	4	
PM _{2.5} , µg/m ³	Annual	35	25	15	10	5
	24-hour ^a	75	50	37.5	25	15

<https://apps.who.int/iris/bitstream/handle/10665/345329/9789240034228-eng.pdf?sequence=1&isAllowed=y>

Addis below 2nd interim?

- The total population of Addis Ababa in 2020 was taken from UN population data sources (4.8 mln). We considered that 34% of the total population was adult of 30 years old and above (Addis Ababa Health Bureau, personal communication, February 2, 2021). The annual mortality for the year 2020 was taken from Addis Ababa Mortality Surveillance Program. A 7% of the incidence of injury was taken from published articles addressing the mortality surveillance program. We used the three WHO annual interim target options and the WHO annual mean air quality guideline as cut-off reference values to estimate the excess deaths because of PM2_5 pollution as measured by the three BAMs separately.

Table 3.**Estimated annual attributable deaths from long-term exposure to PM_{2.5} air pollution in 2020.**

BAM location	Annual mean PM _{2.5} concentration, µg/m ³ (2017–2020)	Annual attributable deaths with 95% CI							
		N (%)							
		WHO annual Interim 1 (35 µg/m ³)		WHO annual Interim 2 (25 µg/m ³)		WHO annual Interim 3 (15 µg/m ³)		WHO annual Mean (10 µg/m ³)	
		N (95% CI)	%	N (95% CI)	%	N (95% CI)	%	N (95% CI)	%
"TASH" School	42.4	502 (330, 661)	4.4	1147 (761, 1495)	9.9	1753 (1176, 2265)	15.2	2043 (1377, 2627)	17.7
School	34.7	0	0	654 (431, 859)	5.7	1290 (858, 16770)	11.2	1598 (1065, 2063)	13.8
US Embassy	24.2	0	0	0	0	613 (403, 805)	5.3	936 (620, 1225)	8.1

"0" shows that the current level is below the WHO cut off with zero risk.

CI indicates confidence interval.

Result 5: Premature deaths – AirQ+ (WHO)

11539 deaths in 2020, aged >30yrs

BAM location	PM _{2.5} $\mu\text{g}/\text{m}^3$ (2017-2020)	Annual Attributable deaths with 95 CI, # (%)							
		WHO AI 1 (35 $\mu\text{g}/\text{m}^3$)		WHO AI 2 (25 $\mu\text{g}/\text{m}^3$)		WHOAI 3 (15 $\mu\text{g}/\text{m}^3$)		WHO annual Mean (10 $\mu\text{g}/\text{m}^3$, 2005 guideline)	
		# (95%CI)	%	# (95%CI)	%	# (95%CI)	%	# (95%CI)	%
"TASH"	42.4	502 (330-661)	4.4	1147 (761-1495)	9.9	1753 (1176-2265)	15.2	2043 (1377-2627)	17.7
<u>Internl</u> School	34.7	0	0	654 (431, 859)	5.7	1290 (858-16770)	11.2	1598 (1065-2063)	13.8
US Embassy	24.2	0	0	0	0	613 (403-805)	5.3	936 (620-1225)	8.1

Remark: "0" shows the current level is below the WHO cut off with zero risk; AI - Annual Interim

If the 42.4 $\mu\text{g}/\text{m}^3$ is reduced to 10 $\mu\text{g}/\text{m}^3$, 2043 premature deaths could be saved.